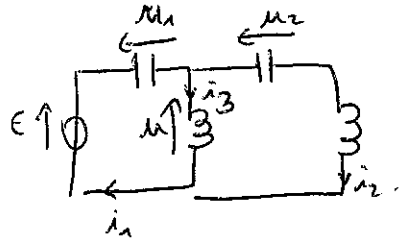
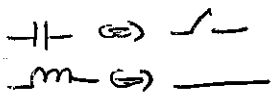
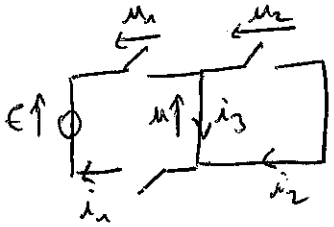
4)



À $t=0^-$:





* $u(0^-) = 0$ (fil)
* $i_1(0^-) = 0$ (int ouvert)
* $i_2(0^-) = 0$ (int ouvert)

$\Rightarrow i_3(0^-) = 0$ (loi des noeuds)

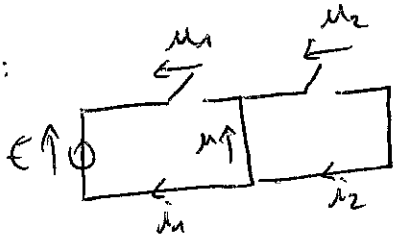
* $u_2(0^-) = 0$ (loi des mailles à droite).
* $u_1(0^-) = 0$ (condensateur déchargé).

→ Continuités :
- Tension dans condensateur : $u_1(0^+) = 0$ / $u_2(0^+) = 0$
- Intensité dans bobine : $i_3(0^+) = 0$ / $i_2(0^+) = 0$

À $t=0^+$:

* Loi des noeuds : $i_1(0^+) = 0$
* Loi des mailles : $u(0^+) + u_1(0^+) = \mathcal{E} \Rightarrow u(0^+) = \mathcal{E}$.

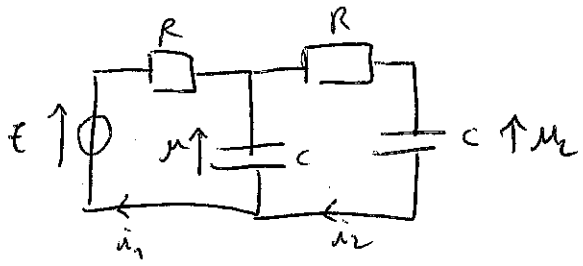
$t \to +\infty$:



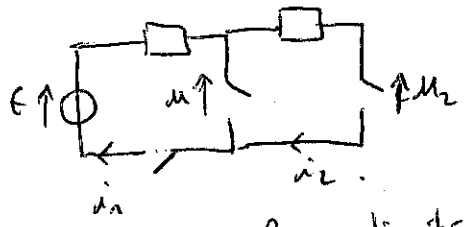
$\left.\begin{array}{l} i_1(\infty) = 0 \\ i_2(\infty) = 0 \end{array}\right\}$ int ouvert.

$u(\infty) = 0$ (fil)

5)



À $t=0^-$:

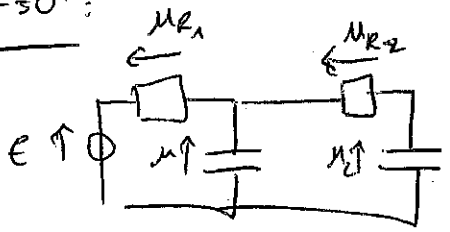


* $u_2(0^-) = 0$
* $u(0^-) = 0$
} déchargés d'après l'énoncé.

Par continuité de la tension aux bornes des C :

* $u_2(0^+) = 0$
* $\underline{u_2(0^+) = 0}$

À $t=0^+$:



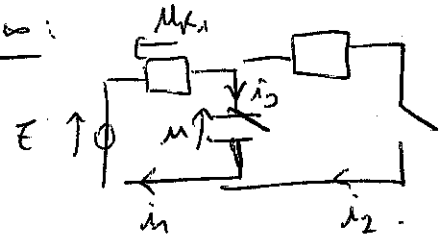
* Loi des mailles (à droite) :

$\rightarrow u_{R_2}(0^+) = 0 \rightarrow$ Loi d'Ohm : $\underline{i_2(0^+) = 0}$

* Loi des mailles (à gauche) :

$u_{R_1}(0^+) = \epsilon \Rightarrow$ Loi d'Ohm : $\underline{i_1(0^+) = \frac{\epsilon}{R}}$.

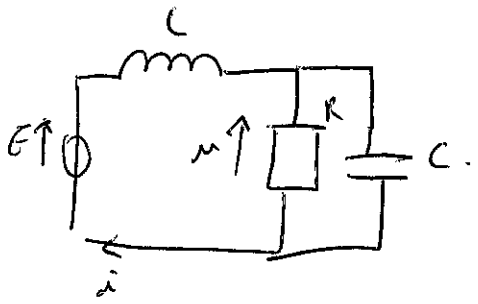
$t \rightarrow +\infty$:



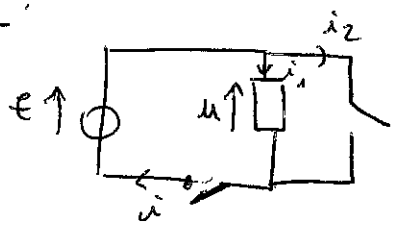
$\underline{i_2(\infty) = 0}$
$i_3(\infty) = 0$
} loi des noeuds : $\underline{i_1(\infty) = 0}$.

Ohm : $u_{R_1}(\infty) = 0 \Rightarrow \underline{u(\infty) = \epsilon}$ d'après la loi des mailles.

6)



À $t=0^-$:



* $i(0^-) = 0$ (interrupteur ouvert)
* $i_2(0^-) = 0$ (idem)

) Loi des noeuds : $i_1(0^+) = 0$

↓

Loi d'Ohm :

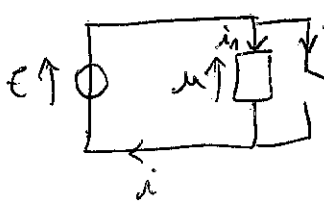
$u(0^-) = 0$

Continuités :

→ Tension dans C : $\boxed{u(0^+) = 0}$

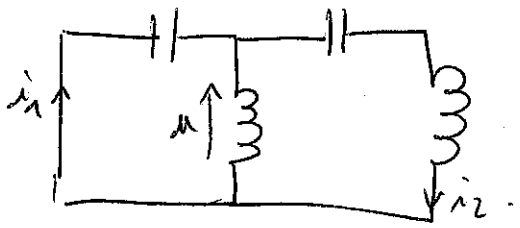
→ Intensité dans L : $\boxed{i(0^+) = 0}$

$t \to +\infty$:

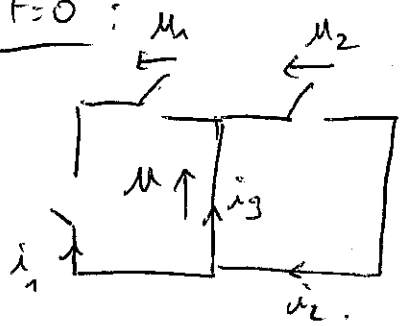


* Mailles : $\boxed{u = E}$
* $i_2(\infty) = 0$ (int ouvert) $\Rightarrow i_{(\infty)} = i_1(\infty)$
* Loi d'Ohm : $i_1(\infty) = \frac{u(\infty)}{R} = \boxed{\frac{E}{R} = i(\infty)}$

7)



À $t=0^-$:



* $i_1(0^-) = 0$ (interrupteur ouvert)
* $i_2(0^-) = 0$

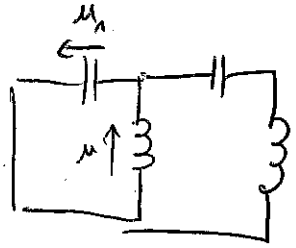
} Loi des nœuds : $i_3(0^-) = 0$.

* $u_1(0^-) = E$ (énoncé).

Continuités :

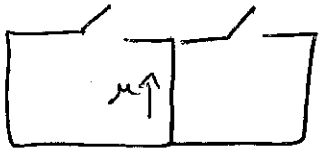
- $u_1(0^+) = E$.
- $i_3(0^+) = 0$
- $i_3(0^+) = 0$.

À $t=0^+$:



* Loi des nœuds : $i_1(0^+) = 0$.
* Maille (gauche) : $u(0^+) - u_1(0^+) = E$

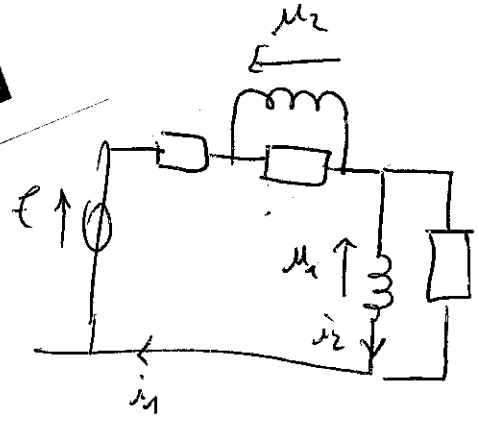
$t \to +\infty$:



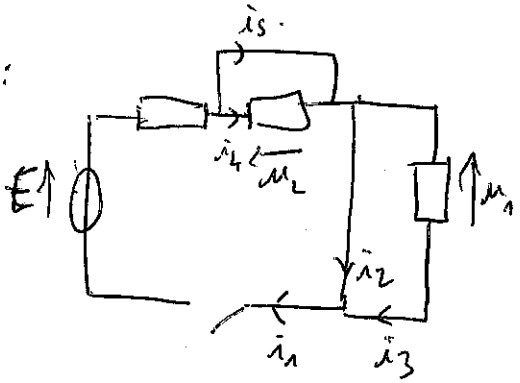
$u \underset{t\to\infty}{\to} 0$ (fil).

$i_1 \underset{t\to\infty}{\to} 0$ (int ouvert)

$i_2 \underset{t\to\infty}{\to} 0$ (int ouvert)



À $t=0^-$:



* $u_1(0^-) \neq 0$ (fil) $\Rightarrow$ Ohm : $i_3(0^-) = 0$.
* $i_1(0^-) = 0$ (int ouvert)
* Nœuds :

$$i_2(0^-) + i_3(0^-) = i_1(0^-)$$

$$\Rightarrow i_2(0^-) = 0.$$

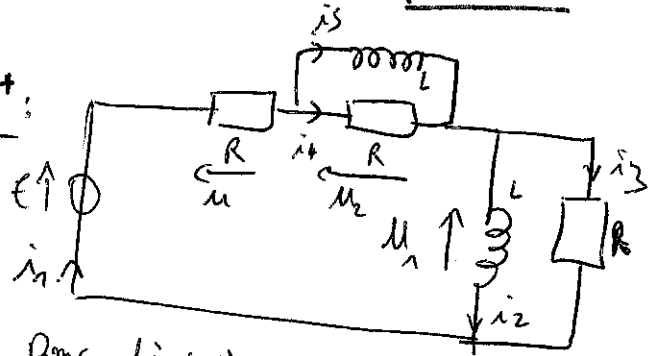
* $u_2(0^-) = 0$ (fil) $\rightarrow$ Ohm : $i_4(0^-) = 0$
* Nœuds : $i_5(0^-) = 0$

Continuités :

$\rightarrow$ Bobine intensités : $\boxed{i_5(0^+) = 0}$

$\boxed{i_2(0^+) = 0.}$

À $t=0^+$:



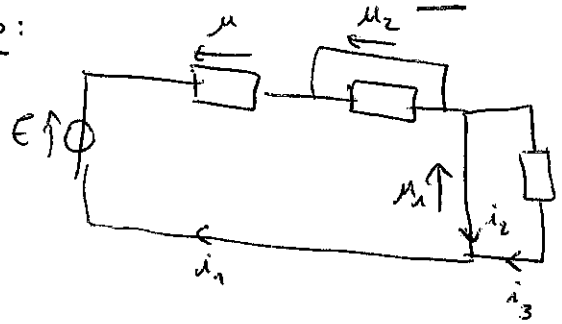
* Nœuds : $i_1(0^+) = i_4(0^+) = i_3(0^+)$
* Mailles : $u_1(0^+) + u_2(0^+) + u(0^+) = E$.
* Ohm : $R i_3(0^+) + R i_4(0^+) + R i_1(0^+) = E$.

Donc, $\boxed{i_1(0^+) = i_4(0^+) = i_3(0^+) = \frac{E}{3R}}$

* Ohm : $\boxed{u_1(0^+) = R i_3(0^+) = \frac{E}{3}}$

$\boxed{u_2(0^+) = R i_4(0^+) = \frac{E}{3}}$

$t \to \infty$:



* $\boxed{\begin{matrix} u_1 \xrightarrow{t\to\infty} 0 \\ u_2 \to 0 \end{matrix}}$ (fils)
* Mailles : $u = \mathcal{E} \Rightarrow$ Ohm : $\boxed{i_1 \to \frac{\mathcal{E}}{R}}$.
* Ohm : $i_3 \to 0 \Rightarrow$ Nœuds : $\boxed{i_2 = i_1 \to \frac{\mathcal{E}}{R}}$